REMARKS

Claims 1, 6, 11, 16, 21, 25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Carlson et al. (US Patent No. 4,523,230) in view of Okada et al. (US Patent No. 5,247,169) and Levine (US Patent No. 4,499,497).

As to the independent claims 1, 11 and 21 the office action states Carlson et al. teaches a method for reducing sparkle artifacts in a liquid crystal imager (See Col. 13, Lines 46-50). With respect to claim 1, the office action states Carlson teaches the claimed method by teaching to apply a combined video signal (summer) to the imager reducing effects of orthogonal fields in adjacent pixels (sparkle in the Carlson et al. reference and in the preamble) of the imager (See Fig. 2a, Col. 8, Lines 24-62 and Col. 18, Lines 29-49).

Applicant notes for the record that Carlson lacks any teaching relating to reducing the effects of orthogonal fields in adjacent pixels. Carlson refers to "sparkle" only once in the cited reference. There, Carlson defines "sparkle" as a "spatial frequency artifact" arising from application of a specific filtering technique to a signal that has undergone wide band coring.

In contrast, the phenomena to which applicant refers, orthogonal fields in adjacent pixels, are an electromagnetic phenomena. These phenomena are not artifacts arising from the application of a particular signal processing technique.

Applicant further notes that Carlson lacks any teaching that "applying combined video signal (summer) to the imager" will reduce "sparkle". This teaching is lacking even if one adopts, arguendo, Carlson's definition of "sparkle".

Carlson's teachings relating to Carlson's "sparkle artifacts" are limited to suggesting the use of narrow band coring, instead of wide band coring, to suppress Carlson's

"sparkle". Carlson lacks any suggestion that any other approach, or additional change to any apparatus or method could be used to suppress Carlson's "sparkle". Carlson is entirely silent on suppressing "sparkle" of the type defined in applicant's specification. And, there is no suggestion in Carlson, or in any other cited reference, to modify Carlson or any cited reference to arrive at applicant's claimed invention.

Applicant further notes that Carlson's disclosure is limited to operating on the incoming signal in a spatial frequency domain. The incoming signal is separated by a spectrum analyzer to provide a plurality of sub-spectra bands representing spatial frequencies. It is these subspectrum bands that are synthesized into a single output image representing signal. Therefore Carlson lacks any disclosure or teaching of any part of applicant's invention as recited in applicant's claims.

The office action recognizes Carlson et al. does not show step of dividing a video signal for a picture into a higher brightness level signal and lower brightness level signal, low pass filtering lower brightness level signal, delaying higher brightness level signal to match a processing delay incurred by low pass filtering.

However, the office action states Okada et al. teaches dividing a video signal for a picture into a higher brightness level signal and louver brightness level signal (column 2, lines 17-33), low pass filter (See Fig. 1, item 10-11) arrangement and a delay matching circuit (See Fig. 1, item 15 16, 18) are for independently low pass filtering rising transients and falling transients in low brightness signal to reduce adjacent pixel interdependence, and the delay matching circuit for the high brightness signal (See Fig. 1-3, items 10-11, 15-16, 18, S7, Col. 7, lines 5-16 and Col. 3, Lines 4-13).

Applicant respectfully disagrees for the following reasons. First there exists no teaching in Okada of "dividing a video signal for a picture into a higher brightness level signal and lower brightness level signal (column 2, lines 17-33)". Second, there is no teaching in Okada of "independently low pass filtering rising transients and falling transients in low brightness signal." Third, applicant's claims do not recite any feature of "independently low pass filtering rising transients and falling transients in low brightness signal".

With respect to applicant's claim 1 feature, " dividing a video signal for a picture into a higher brightness level signal and a lower brightness level signal ; the examiner errs in relying on Okada's disclosure of "means for dividing light" as teaching or suggesting applicant's features relating to dividing video signals. Okada describes a light dividing means, and then only in the context of an optical subsystem. Optics is a non analogous art. The dividing means of the Okada reference is described by Okada (abstract) as follows: "A beam splitter divides light reflected by the surface of the object into two parts. Each of the divided parts of the light is passed through an optical filter whose transmission wavelength range is set according to the colors of the object, to adjust the quantity of transmitted light from a high-brightness part of the object surface and the quantity of transmitted light from a low-brightness part of the object surface to a reference level."

The principles of engineering and physics applicable to dividing into light beams using beamsplitters, ( the science of optics) are not applicable to the task of decomposing a video signal into video signal components. Okada lacks any teaching that the term "light" should be given any meaning other than its ordinarily understood meaning, that is "radiant energy that is capable of exciting the retina" (The New IEEE Standard Dictionary of Electrical and Electronics Terms, The Institute of Electrical and Electronics Engineers, Inn, 1993,

page 714.) The term "video signal" as commonly understood and as described in applicants specification, for example, in paragraph 32: "The video signal is a digital signal, and the waveform is a succession of digital samples representing brightness levels."

One of ordinary skill in the art would not be motivated to provide a video signal to an optical dividing means such as a beamsplitter so as to divide the video signal into high and low brightness level video signal components. Nor would one apply a beam splitter to a video signal prior to low pass filtering. One of ordinary skill in the art would not expect success in making such a combination. Therefore, there is no motivation to combine a teaching of an optical subsystem designed to divide visible light into light beams with any other reference to arrive at applicant's claimed invention.

Further, even considering arguendo, the teaching of Okada regarding dividing means to be analogous art, the examiner errs on this ground of rejection because no reference contains a teaching, suggestion or incentive which would have led one of ordinary skill in the art to modify or combine the optical light dividing subsystem of Okada with the teaching of Carlson, or of Levine to arrive at applicant's claimed invention. It would be technically impossible and non feasible to modify such an optical sub-system so that it could divide a video signal into components in any way, especially in a way that would meet the requirements of applicant's claims 1, 11 and 12. This fact, in and of itself, is a disincentive to the artisan to do so.

In addition, the purpose for which the Okada optical subsystem is intended (dividing light reflected from the surface of an object to be inspected)is not normally present in the environment in which applicant's apparatus is operated. Therefore, the artisan would not have been motivated by Okada, Carlson, or any other reference, taken alone or in

combination, to combine the light dividing features described in Okada with any another reference in such a manner as to meet the terms of applicant's claims reciting dividing video signals.

Further, the examiner appears to rely on impermissible hindsight and applicant's own disclosure to interpret the reference as disclosing or suggesting "means for dividing a signal", when in fact the reference describes only "means for dividing light."

Further, in this context, the reference describes "brightness" solely as it relates to a high or low brightness part of an object surface. The examiner's conclusion that such a description of dividing light reflected from a high or low brightness part of an object surface teaches or suggests a decomposer for decomposing a video signal into high or low brightness level video signal components could only have been postulated using impermissible hindsight gleaned from reading applicant's specification describing "decomposing video signals" and "brightness level video signal components".

Contrary to the examiner's assertion in the office action, Okada does not teach that the low pass filters (10, 11) are for "independently low pass filtering rising transients and falling transients in said low brightness signal to reduce adjacent pixel interdependence". Such an interpretation of Okada contradicts the actual disclosure of Okada. Okada specifically describes the cited low pass filters illustrated at 10 and 11 are for filtering noise from amplified image signals A2 and B2. (See Okada col 4 lines 52 -59 ") In step S3, the low-pass filters 10 and 11 remove noise components from the amplified image signals A2 and B2 and provide image signals A3 and B3, respectively. ") There is no mention in Okada of rising and falling transients, nor is there any discussion in Okada related to adjacent pixel

interdependence. For that matter, there is no recitation of "rising and falling transients" in applicant's claims.

Further, applicant's claims recite a low pass filter that operates only on a low brightness level signal component of a video signal. The filters 10 and 11 of Okada, on the other hand, are applied to both of the amplified image signals A2 and B2. According to Okada (see, for example, Figure 1) the amplified image signals A2 and B2 taken together comprise the entire image signal to be processed. Thus, there is no disclosure in Okada of using low pass filters 10 and 11 to filter "only a lower brightness level signal component of a video signal." Further, Okada describes the light reflected from the object should be equalized before forming an image signal. See for example, Okada col. 2 lines 30-37. Okada states, "In this way, the quantities of the transmitted light from the high and low brightness parts of the object surface are equalized, and the image pick-up means simultaneously pick up the images of the high and low brightness parts of the object at the same positional relations and photoelectrically convert the images into electric image signals."

Okada further states amplifiers 8 and 9 are adjusted to have equal output signal levels. " In step S2, the object kind presetting unit PS controls amplification factors of the amplifiers 8 and 9 so that output signal levels of the amplifiers 8 and 9 will be equal to each other once the quantity of light from the white part of the capsule transmitted through the optical filter 4 and the quantity of light from the red part of the capsule transmitted through the optical filter 5 are adjusted to the reference level. Thus, Okada describes that image signals A1 and BI are equal with respect to the high and low brightness parts of the object. This teaching is in contradiction to applicant's claims.

The office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Okada et al. teaching into the Carlson et al. system in order to provide an image signal that causes no erroneous determination due to noise (See Col.1, lines 62-64 in the Okada et al. reference).

Applicant respectfully disagrees because no modification of the Carlson system with the Okada beamsplitter for dividing light would result in applicant's claimed invention.

The office action recognizes that Carlson et al. and Okada et al. do not teach combining low pass filtered lower brightness level signal and delay matched higher brightness level signal to generate modified video signal yielding reduced sparkle artifacts in imager. However, the office action states Levine teaches combining low brightness video signal and delayed signal to provide fully processed video signal (See Fig. 1-2, items 27-29, in description See Col. 3, lines 44-55).

Applicant respectfully disagrees because Levine does not teach any feature of applicant's claimed invention. Specifically Levine lacks any teaching of... delaying said higher brightness level signal to match a processing delay incurred by said low pass filtering; and, combining said low pass filtered lower brightness level signal, and said delay matched higher brightness level signal.

First, the office action has failed to point out how Levine teaches or suggests combining a low pass filtered lower brightness level signal with a delay matched higher brightness level signal. A teaching of a "delayed signal" does not suggest or disclose a "delay matched higher brightness level signal." A teaching of "cross fading"is not a teaching of combining. Levine's description in the cited Col. 3 lines 44-55 reads as follows.

> "In more critical applications, amplifier 21 video output can be applied to transient peaking circuitry 27, which will, except for time delay, correct the signal for low brightness level, and to time delay circuitry 28, which will introduce

**corresponding delay into video signals of all brightness levels.** A cross-fader 29 can then cross-fade between peaking circuitry 27 output video signal at low brightness levels and delay circuit 28 video output signal at high brightness levels to provide a fully processed video output signal. The cross-fading is shown being controlled by AGC signal supplied to it via control line 29a from detector 22. "

Furthermore, Levine teaches away from applicant's claimed invention because Levine teaches to add time delay circuitry 28 to introduce a delay into video signals of **all brightness levels.**

The office action states it would have been obvious to one of ordinary skill in the art at the time of invention to incorporate Levine approach for reducing sparkle artifacts in the Carlson et al. and Okada et al. apparatus to improve signal-to-noise ratio (See Col. 1, Lines 35-40 in Levine reference).

First, Levine discloses no approach for reducing sparkle artifacts in any apparatus, including the apparatus of Carlson and Okada. Therefore the motivation cited by the examiner is not sufficient to establish a prima facie case of obviousness. Second, applicant's invention is not related to improving signal to noise ratio as described the disclosure of Levine. Therefore the cited Col 1, lines 35-40 of Levine could not provide any motivation regarding suppressing sparkle artifacts in any device. Third, there is no motivation to combine Levine with Okada to suppress sparkle artifacts, because the device of Okada is not a device that could have sparkle artifacts. Even assuming, arguendo, that it did have sparkle artifacts, using the techniques of Levine would not suppress them. Nor would the techniques of Carlson.

All other claims in the case depend from claims 1, 11 and 21. Applicant believes claims 1, 11 and 21 are in condition for allowance. Accordingly, Applicants respectfully request the withdrawal of the rejections under 35 U.S.C. § 103(a) and allowance of the claims as amended herein.

Applicant invites the Examiner to call the undersigned to clarify any issues raised herein.

Respectfully submitted,

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